

Executive Summary

This document describes the technical requirements for using the Defense Information Infrastructure (DII) Common Operating Environment (COE) to build and integrate systems. It provides implementation details that describe, from a software development perspective, the following:

- ¥ the COE approach to software reuse,
- ¥ the COE runtime execution environment,
- ¥ the definition and requirements for achieving COE compliance,
- ¥ the process for automated software integration, and
- ¥ the process for electronically submitting/retrieving software components to/from the COE software repository.

Background

The DII COE concept is best described as an **architecture** that is fully compliant with the *DoD Technical Architecture for Information Management (TAFIM)*, Volume 3, an **approach** for building interoperable systems, a collection of **reusable software** components, a **software infrastructure** for supporting mission area applications, and a set of **guidelines and standards**. The guidelines and standards specify how to reuse existing software, and how to properly build new software so that integration is seamless and, to a large extent, automated.

The COE is a "plug and play" open architecture designed around a client/server model. The COE is *not* a system; it is a *foundation* for building an open system. Functionality is easily added to or removed from the target system in small manageable units, called *segments*. Structuring the software into segments is a powerful concept that allows considerable flexibility in configuring the system to meet specific mission needs or to minimize hardware requirements for an operational site. Site personnel perform field updates by replacing affected segments through use of a simple, consistent, graphically oriented user interface.

Two systems presently use the DII COE: the Global Command and Control System (GCCS), and the Global Combat Support System (GCSS). Both use the same infrastructure and integration approach, and the same COE components for functions that are common between the two systems. GCCS is a C4I system with two main objectives: the near-term replacement of the World-Wide Military Command and Control System (WWMCCS) and the implementation of the C4I For the Warrior concept. GCCS is already fielded at a number of operational CINCs. GCSS is presently under development and is targeted for the warfighting support functions (logistics, transportation, etc.) to provide a system that is fully interoperable with the warfighter C4I system. Implemented to its fullest potential, GCSS will provide both warfighter support to include

reachback from deployed commanders into the CONUS sustaining base infrastructure, and cross functional integration on a single workstation platform.

The DII COE is initially based on work from the C4I arena with contributions from the logistics arena to include functions such as global data management and workflow management. It will expand further as more functional areas desire to employ its services in areas such as Electronic Commerce/Electronic Data Interchange (EC/EDI), transportation, base support, personnel, health affairs, and finance.

The COE represents a departure from traditional development programs. It emphasizes incremental development and fielding to reduce the time required to put new functionality into the hands of the warrior, while not sacrificing quality nor incurring unreasonable program risk or cost. This approach is sometimes described as a "build a little - test a little - field a lot" philosophy. It is a process of continually evolving a stable baseline to take advantage of new technologies as they mature and to introduce new capabilities. But the changes are done one step at a time so that the warfighters always have a stable baseline product while changes between successive releases are perceived as slight.

DISA maintains the COE, GCCS, and GCSS software in an on-line configuration management repository called CSRS (COE Software Repository System). This approach decreases the development cycle by allowing developers to receive software updates, or to submit new software segments, electronically. With appropriate security measures, installation costs are also reduced because operational sites may be updated electronically across SIPRNET.

Conclusion

The principles described in this document are not unique to GCCS nor GCSS. They can be readily applied to many other application areas. The specific software components selected for inclusion in the COE determine the mission area that the COE can address. The concepts herein represent the culmination of open systems evolutionary development from both industry and government. Most notably, the Army Common Software (CS) and the Navy Joint Maritime Information System (JMCIS) COE efforts have greatly influenced DII COE development.

The DII COE architecture is an innovative framework for designing and building military systems. Because it reuses software contributed by mature programs, it utilizes field proven software for common warrior functions. The engineering procedures for adding new capabilities and integrating systems are mature, and have been used for several Navy JMCIS releases as well as in all production GCCS releases. The end result is a strategy for fielding systems with

increased interoperability, reduced development time, increased operational capability, minimized technical obsolescence, minimal training requirements, and minimized life cycle costs.